



(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
01.07.1998 Bulletin 1998/27

(51) Int. Cl.⁶: H04L 9/08, H04Q 7/32

(21) Application number: 96309444.6

(22) Date of filing: 23.12.1996

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE
Designated Extension States:
AL LT LV

(71) Applicant: ICO Services Ltd.
London W6 9BN (GB)

(72) Inventor:
Johnston, Thomas Francis
London, W2 6DG (GB)

(74) Representative:
Read, Matthew Charles et al
Venner Shipley & Co.
20 Little Britain
London EC1A 7DH (GB)

(54) Key distribution for mobile network

(57) A satellite mobile telecommunications system includes mobile terminals 2a, 2b which can communicate with one another using end-to-end encryption and decryption techniques. When secure end-to-end communication is required, each terminal uses a common encryption code (RAND) to encode data and decode data transmitted between the terminals. The encryption code is transmitted in a secure manner from a remote database station (15) to the terminals. Each terminal stores a terminal key (K_a , K_b) on its SIM card and the keys are also held in the remote station (15). Partial keys (K_{pa} , K_b) comprising the pseudo random number (RAND) and the keys K_a , K_b stored at the station (15)

are produced at the station (15) by an exclusive OR process in order to mask the keys and the random number. The partial key $K_{pa} = K_a + (\text{RAND})$ is sent to terminal 2a. At the terminal 2a, the partial key K_{pa} is exclusive OR-ed with the locally stored terminal key K_a on the SIM card, so as to recover (RAND). The common code (RAND) is determined by the same process at terminal 2b, from $K_{pb} = K_b + (\text{RAND})$ and the locally stored key K_b . The terminals then both run a GSM encryption algorithm (A5) to encrypt and decrypt transmitted data, on the basis of the common code (RAND).



